ISSUES RELATED TO ALTERNATIVE DEVELOPMENT

Draft Document -- For Discussion Purposes Only

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DEMAND MANAGEMENT

What is demand management?

Many definitions of demand management are possible. For purposes of the CALFED Bay-Delta Program (Program), demand management consists of all actions which increase the utility and economic productivity of existing water supplies. In the context of the Bay-Delta system, both water conservation and water recycling are demand management measures because they produce more benefits without increasing system diversions. Market transfers are demand management measures because they increase economic productivity for a given amount of diversions.

Why is Demand Management Important to the CALFED Program?

The need to resolve the conflict between the necessity for water diversions to support the California economy and the impact caused by diversions upon the aquatic ecosystem, is one of the most critical issues to be addressed. The Program identified the basic problem as a mismatch between supply and demand. The program is developing alternatives to address this issue with actions from both the supply and demand side of the problem.

What are the limitations of Demand Management for the CALFED Program?

While demand management is a fundamental component of the CALFED Program, it is not a silver bullet. Demand management will not solve the problem of levee instability and it is not a substitute for increased environmental habitat. While it can be part of every alternative, it is only one tool needed to "fix the Delta."

One of the specific limitations is that the water savings from demand management actions cannot be specifically targeted to help to meet shortfalls in a critically dry year unless the water savings from other water year types are stored. Thus, demand management actions are often most effective when implemented in combination with other actions.

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Should the CALFED Program Seek to Explicitly Meet Future Demand Levels?

Considerable debate has emerged as to whether the CALFED Bay-Delta Program should plan to meet some future demand level. To plan for future demand levels would require that the Program develop a central plan for future water management. In fact, the trend over the last decade has been to move away from central planning toward more flexible market driven approaches. A central plan would require that CALFED develop demand projections for California, then develop explicit demand and supply side projects to meet that demand. Such a plan would be extraordinarily complex and controversial and would reduce the likelihood that the Program would be able to accomplish anything at all.

An alternative approach is for the Program to develop a physical, biological, and institutional system adequate to allow the conflicts between diversions and the environment to be resolved for a wide variety of reasonable future scenarios. While a strong demand management element is necessary for all CALFED Bay-Delta Program alternatives, the goal of the Program's demand management element should aim to improve reliability, blunt the future growth in demand, and thereby increase the stability of the solution.

HABITAT RESTORATION

Strategy for Addressing Ecosystem Quality

The mission of the CALFED Bay-Delta Program is to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. The overall decline of ecosystem health in the Bay-Delta system and the subsequent decline in species dependent on the Bay-Delta system for all or part of their life cycle has resulted in substantial conflict between beneficial uses of water in the Delta.

While much of the focus on ecosystem problems has centered on fisheries (and especially those populations which have been designated as threatened or endangered under Federal and State laws) the underlying problem is much broader and more far-reaching. A primary reason for the decline of many populations is an overall loss of habitat to support various life stages of aquatic biota. The Bay-Delta system no longer supports a broad diversity of habitats nor the habitat quality necessary to ensure those ecological functions and connectivity necessary to maintain and propagate healthy populations and communities of plants and animals. The steady decline in habitat quantity, diversity, and quality results from many activities both in the Delta and upstream. Activities that have led to the current decline include effects from early unrestricted mining, upstream water development, in-Delta water uses, export of water, water quality degradation, invasion by exotic species, and direct losses at pumps.

The primary program objective for ecosystem quality is to improve and increase the quantity, diversity and quality of aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta system to support sustainable populations of diverse and valuable plant and animal species.

A strategy of the CALFED Bay-Delta Program to address ecosystem quality issues is to focus on habitat restoration as a major goal. The theme for restoration of fish and wildlife populations will be to improve habitat elements that have been modified and are currently insufficient, so that species using the Bay-Delta system for some or all of their life cycles will find conditions that enable them to produce and sustain healthy population levels. Some important habitat types include shallow water, riparian, and shaded riverine aquatic. Elements of habitat include physical attributes such as type of plant cover as well as hydrologic attributes such as flow rate.

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Why is Habitat Restoration Important?

While physical habitat in some parts of the Delta is not a limiting factor to fish and wildlife populations, it is clearly a critical factor in other areas. A premise of the CALFED Bay-Delta is that aggressive habitat restoration, combined with actions to address more direct impacts of diversions, will be more effective in supporting sustainable populations of diverse and valuable plant and animal species than either action alone. Increases in production and survival of key populations through improvements in habitat quantity and quality, should produce more stable populations resulting in fewer restrictions to existing pumping activities.

As stated in the mission statement, the CALFED Bay-Delta Program considers restoration of ecological health or a functioning ecosystem the underlying goal of the program. Ecological health will be measured by the diversity of habitats restored, the degree to which natural hydrologic and geomorphic processes are returned, the connectivity of habitats and the degree to which restored habitats are able to endure without intervention. Without a healthy functioning Bay-Delta system, none of the beneficial uses will be adequately met and the conflicts will continue to exist and most likely worsen.

Habitat restoration will focus on physical, chemical, and biological elements of an ecosystem important to the production and well-being of key species. Habitat includes physical aspects, such as spawning gravel for salmon, and physical and chemical aspects related to the timing and quantity of freshwater flow. While habitat restoration appears to focus primarily on the building blocks or structural aspects of the ecosystem, it is the functioning of the habitat to support sustainable levels of populations and communities which is critical to determining the success of the actions. Another critical aspect concerning habitat restoration is the idea of connectivity; many scientists believe that providing more connections between comparable habitat and less fragmentation will be highly beneficial.

Problems and Limitations with Habitat Restoration

While properly functioning Bay-Delta habitat will contribute significantly to restoring the ecological health of the Bay-Delta system, there are other contributing factors which must also be addressed. Problems associated with diversions, determining protective outflow (for

the Delta and San Francisco Bay), toxics, exotic species and other issues must also be addressed in developing alternatives.

A difficulty associated with habitat restoration is the uncertainty as to how quickly changes will occur and to what extent. Most scientists would think in terms of years to attain functional habitat after significant habitat restoration, i.e. 3 years for wetlands and 10 years for riparian habitat. Since water supply reliability benefits are based on the premise that increasing population size and stability of key species will result in fewer restrictions to pumping, it becomes difficult to assess the benefits to that beneficial use. Additionally, we must be sure that we don't enhance population size only to lose that incremental gain to impacts associated with additional exports.

Another limitation is the extent of knowledge concerning restoration. From a scientific standpoint, the complexity of systems and the lack of understanding of ecological interactions makes restoration problematic. It is difficult to determine cause and effect relationships and determine what is a limiting factor. Adaptive management becomes a critical tool allowing for incremental implementation of actions and responses to manage environmental resources. Because there is an incomplete understanding of the complex biological and physical processes which occur in the Bay-Delta system, the development of reasonable alternatives has relied on existing knowledge and professional judgement. During phased implementation, additional insight, experience and monitoring will support adaptive management efforts to refine or adjust actions.

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MODIFICATION OF FLOW PATTERNS

Intrinsic to the strategy of restoring the ecological health of the Bay-Delta system is the premise that there are periods when the export of water is less damaging to the ecosystem or key species as compared to other more critical periods. These periods or life stages of certain key species when quantity and timing of flow is critical include, outmigration of anadromous fish, spawning of native fish, and developmental periods of juvenile fish when they are vulnerable to flow related stressors. The alternatives attempt to take advantage of those less critical or damaging periods, generally summer and fall, to transfer water through the system, from north of the Delta to the export facilities and to pair this strategy with capturing a portion of winter flood hydrographs and moving this water into storage. This dual strategy can facilitate limiting exports (and possible providing additional spring outflow in dry and critically dry years) during critical periods, generally late winter and spring. While these periods are not absolute, they provide a range of options to analyze the benefits and potential impacts of shifting export patterns.

Additionally, many alternatives attempt to take advantage of storage for environmental uses recognizing that water is often needed to augment outflow at critical life stages during dry and critically dry years.

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